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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 26

Application Number: 08/935,365  
Filing Date: September 22, 1997  
Appellant(s): ROBERTS ET AL.

MAILED

GROUP 1700

James J. Merek  
For Appellant

**EXAMINER'S ANSWER**

This is in response to appellant's brief on appeal filed 5-15-01.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

The brief contains a statement that there are no related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows:

In page 8, referring to issue no. 3, in the heading, the number "18" should be changed to "19", since the body of the issue/paragraph is referring to claim 19 and not claim 18.

**(7)     *Grouping of Claims***

The rejection of claims 1 - 7 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

**(8)     *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9)     *Prior Art of Record***

4,619,765	ROBERTS	10-1986
5,108,627	BERKEBILE ET AL.	4-1992
5,489,388	BROWN ET AL.	2-1996
5,269,920	BROWN ET AL.	12-1993
4,579,659	EADES ET AL.	4-1986

**(10)    *Grounds of Rejection***

The following grounds of rejection are applicable to the appealed claims:

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 recites the limitation "the underdrain block extends the length of the filter media bed". Since it has been established that the invention being claimed in the independent claim 1, of which claim 4 depends therefrom, is a subcombination in the form of an underdrain block, and does not positively recite the limitation of a filter media bed, the limitation of a filter media bed in claim 4 lacks antecedent basis, and thus, making this claim indefinite.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102 (b) as being anticipated by Roberts (765).

With respect to claim 1, Roberts (765) discloses an underdrain block (12) for supporting a filter media bed in a liquid filtration system, comprising an upper wall (40, 44), a pair of side walls (52) and a lower wall, at least one lateral member (partitions, 18, 24) within the underdrain block (12) between the upper wall (40) and the lower wall, at least two chambers (20 & 22, 26 & 28) within the underdrain block and defined by the lateral member (18, 24), and further comprising a plurality of orifices (42) in the upper wall of the block (12), and a plurality of internal orifices (36) in at least the lateral (horizontal) member (18), wherein the underdrain block (12) is jointless and extends substantially the length of a filter media being supported thereby, as in figs. 2 - 3 and cols. 3 - 4.

Claims 1 and 5 were rejected under 35 U.S.C. 102 (b) as being anticipated by Berkebile et al. (627).

With respect to claim 1, Berkebile et al. (627) disclose an underdrain block (10) for supporting a filter media bed in a liquid filtration system, comprising an upper wall (12), a pair of side walls (16) and a lower wall, at least one lateral member (partitions, 24 & 26, 32 & 34) within the underdrain block (10) between the upper wall (12) and the lower wall, at least two chambers (28 & 30, 36, 38 & 40) within the underdrain block and defined by the lateral members (24, 26, 32, 34), as in figs. 2 - 3. Berkebile et al. also disclose the block further comprising a plurality of orifices (14) in the upper wall of the block (10), and a plurality of internal orifices (48, 50 & 33, 35) in at least the lateral member (24 & 32, 34, respectively), wherein the underdrain block (10) is jointless (up to a desired length upon extrusion) and extends substantially the length of a filter media being supported thereby, as in figs. 2 - 3 and cols. 5 - 8

Concerning claim 5, Berkebile et al. disclose the internal orifices (48, 50) extending in the same direction as the orifices (14) in the upper wall (12) of the underdrain block (10). as in figs. 1 - 3 (claim 5).

Claims 1 - 5 was rejected under 35 U.S.C. 102 (b) as being anticipated by Brown et al. (388).

With respect to claim 1, Brown et al. (388) disclose an underdrain block (146) for supporting a filter media bed in a liquid filtration system, comprising an upper wall (148), a pair of side walls (152) and a lower wall (150), at least one lateral member (internal walls, 154) within the underdrain block (146) between the upper wall (148) and the lower wall (150), at least two chambers (156 & 158) within the underdrain block and defined by the lateral member (154), as in figs. 11 - 12. Brown et al. also disclose the block further comprising a plurality of orifices (164) in the upper wall (148) of the block (146), and a plurality of internal orifices in the lateral members (in both transverse and vertical internal walls, 154), wherein the underdrain block (146) is jointless (at least up to a length of 4 feet) and extends substantially the length of a filter media being supported thereby, as in figs. 11 - 12 and cols. 9 - 10. Note that the examiner has considered that the filter media being supported by the underdrain block having a length of at least up to 4 feet.

Regarding claims 2 and 3, Brown et al. also disclose one conduit (26) in the lower wall for an effluent to flow out of the underdrain block and for water and air to flow into the underdrain and up towards the filter media bed, and further comprising a passageway between an end of at least one chamber (158) and a wall sleeve (20), wherein the wall sleeve (20) providing the conduit (26), as in figs. 1 and 11 and cols. 4 - 6 and 9 - 10.

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With regards to claim 4, it is inherent that upon supporting a liquid filtration system having a filter media bed having a length of at least up to 4 feet (as mentioned above), that the underdrain of Brown et al. (388) would be extending the length of that filter media bed.

Concerning claim 5, Brown et al. disclose the internal orifices formed in the transverse (horizontal) lateral member (154) of the block (146) extending in the same direction as the orifices (169) formed in the upper wall (148), as in figs. 11 - 12.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 - 7 and 28 were rejected under 35 U.S.C. 103 (a) as being unpatentable over Brown et al. (388) in view of Roberts (765) or Berkebile et al. (627).

With respect to claims 6 - 7 and 28, Brown et al. do not disclose the underdrain block having a longitudinal length of at least 10 feet (as in claim 6), and/or, at least 20 feet (as in claim 7), and lastly, at least 5 feet (as in claim 28) and being jointless at those lengths mentioned above, it is well-known in the art and obvious that underdrain blocks (having short or long lengths) may be manufactured (by extrusion) without joints (thus, jointless) up to certain desired



lengths by the manufacturer, such as the lengths of 5 feet, 10 feet, 20 feet or longer, depending on the size of a liquid filtration system and/or the filter media used by the filtration system, and the amount of fluid to be processed by the filtration system. In other words, the size (such as the length) of the filter media bed, depends on its capacity to process certain amount of fluids at a time, as well as on the time it is required for processing the fluid, which means that the larger the amount of fluid to be processed, the larger or extensive the filter media bed must be made.

Therefore, in this instance, longer or larger underdrain blocks are required to support such longer or larger filter media beds. It is known in the art and considered an obvious modification to manufacture or extrude underdrain blocks in various lengths and sizes, including those longer than 4 feet long, such as those of 5 feet, 10 feet or 20 feet, so that one underdrain block completely supports an entire length of the filter media bed, depending on the user's requirements and type of filtration application, and in the instance that the filter media bed required by the filtration process is at least about 5 feet, 10 feet or 20 feet, the underdrain blocks may be extruded up to those lengths to completely support the filter bed without requiring the use of joints. For example, Roberts (765) teach that underdrain blocks of 4 feet (typical length) had been made from longer (which are longer than 4 feet, which includes those lengths of 5, 10 or 20 feet mentioned above) continuous multi-block single units of extruded blocks and then cutting them into 4 feet lengths (See col. 4, lines 36 – 42), in order to facilitate easier transport of those blocks to the filtration sites and arrange them in any configuration as the filtration space required. Alternatively, Berkebile et al. (627) teach underdrain blocks (10) could be extruded to form continuous lengths of filter (underdrain) block, which include those having a longitudinal

lengths of 5 feet, 10 feet, and/or 20 feet, as in col. 7, lines 54 – 61. It is considered obvious to one of ordinary skill in the art at the time of the invention to modify the length of the underdrain block of Brown et al. (388), by adding the teachings of Roberts (765) or Berkebile et al. (627), in order to form longer blocks necessary to support longer filter media beds of liquid filtration systems.

Claim 18 was rejected under 35 U.S.C. 103 (a) as being unpatentable over Brown et al. (388) in view of Brown et al. (920).

With respect to claim 18, Brown et al. fail to disclose an underdrain block comprising three lateral members within said underdrain block, in which said three lateral members comprising two vertical lateral members and one horizontal lateral member, wherein said vertical lateral members dividing the interior of said underdrain blocks into three sections of approximately equal sizes, and said horizontal lateral member intersecting said vertical lateral members such that said horizontal lateral member further divides said interior into six chambers, which comprise of three upper chambers of approximately equal sizes, and three lower chambers, also of approximately equal sizes being located above and below said horizontal lateral member, respectively. Brown et al. (920) teach an underdrain block (16) comprising lateral members (internal walls, 40), wherein at least two of said lateral members (40) are vertical, at least 2 are substantially vertical (inclined) lateral members and one horizontal lateral member, as seen in figure 1. Brown et al. (920) teach the horizontal and vertical lateral members

(internal walls, 40) dividing the interior of the underdrain block (16) into 6 chambers or conduits (42, 34), wherein three of said six chambers are upper chambers (34) above the horizontal lateral member (transverse wall), and the three other (lower) chambers (42) are below said horizontal lateral member, as seen in figure 1. As seen in fig. 1, the cross-sectional area of the upper chambers (34) are approximately (substantially, or greater than 50%) equal to one another, and the cross-sectional area of the lower chambers (42) are also approximately (substantially, or greater than 50%) equal to one another. It is considered obvious to one of ordinary skill in the art at the time of the invention to modify the underdrain block of Brown et al. (388) by adding the embodiments taught by Brown et al. (920) in order to provide a plurality of interconnecting chambers or conduits which evenly distributes and mixes the back washing water and air passing through the underdrain block prior to introduction to the filter media bed for an improved and even scouring and cleaning of the filter media, as stated in column 4, lines 37 - 45.

Claim 18 was also rejected under 35 U.S.C. 103 (a) as being unpatentable over Berkebile et al. (627) in view of Brown et al. (920).

With respect to claim 18, Berkebile et al. also disclose the underdrain block comprising three lateral members within said underdrain block, in which said three lateral members comprising at least two vertical lateral members (26, 32, 34) and one horizontal lateral member (24), wherein one of the vertical lateral members (26) extends straight from the lower wall towards the horizontal/transverse wall/lateral (24) to divide the interior of the block into two equal sized chambers below the horizontal lateral (24), and the other substantially vertical

(inclined) lateral members (32, 34) divide the (upper) interior of the underdrain block into three sections/chambers of approximately equal (substantially, or greater than 50%) sizes, and the horizontal lateral member (24) intersecting said vertical lateral members, as in figs. 2 – 3.

However, Berkebile et al. fail to disclose two vertical lateral members dividing the lower interior (below the horizontal member 24) of the block into three approximately equal chambers (as in claim 18). It is well known in the art of underdrain blocks having vertical lateral members dividing the interior of the blocks into 6 chambers, of which three upper chambers (above a horizontal lateral) are of approximately equal sizes, and three lower chambers (below the same horizontal lateral) are also of approximately equal sizes, as shown by Brown et al. (920). Brown et al. (920) teach an underdrain block (16) comprising lateral members (internal walls, 40), wherein at least two of said lateral members (40) are vertically straight dividing the lower interior of the underdrain block (16) into 3 chambers or conduits (42), as seen in figure 1. As seen in fig. 1, the cross-sectional area of the lower chambers (42) are also approximately (substantially, or greater than 50%) equal to one another. It is considered obvious to one of ordinary skill in the art at the time of the invention to modify the underdrain block of Berkebile et al. (627) by adding the second vertical lateral in the lower interior of the block as taught by Brown et al. (920) in order to provide additional chambers or conduits which evenly distributes and mixes the back washing water and air passing through the underdrain block prior to introduction to the filter media bed for an improved and even scouring and cleaning of the filter media, as stated in column 4, lines 37 - 45.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al. (388) or Berkebile et al. (627) and Brown et al. (920), as applied to claim 18 above, and further in view of Eades et al. (U.S. 4,579,659).

With respect to claim 19, Brown et al. (388), as modified by Brown et al. (920), fail to disclose a plurality of air nozzles locate in each section of the underdrain, wherein each air nozzle is located at different lengths or points along the length of said underdrain, and furthermore, said air nozzle comprising a pipe having a closed end and an open end, wherein said open end is situated in said upper chamber substantially near said horizontal lateral member, and said pipe is extending from said lower wall of said underdrain through an internal orifice into said upper chamber, having a vertical slot proximate said closed end of said pipe and situated in the lower chamber substantially near said lower wall, and having a hole situated in said lower chamber substantially near said horizontal lateral member.

Eades et al. (659) teach a gravity filter including an underdrain (12) having a plurality of air nozzles (20) located in each section of said underdrain (12), wherein each nozzle (20) is located at different lengths or points along the length of said underdrain (12), as seen in figures 1 - 2. Eades et al. (659) teach each of said nozzles (20) comprising a pipe or tube sheet (21) having a closed end (34) and an open end (35), wherein said open end (35) is situated substantially near a horizontal lateral member (21), and having a plurality of slots (38) proximate said closed end (34). Although Eades et al. do not teach said slot (38) is vertical or horizontal, it

is obvious and well known that the orientation of said slots (38) is arbitrary depending on the whim or design specification of the manufacturer of said air nozzle pipes. It is also well-known in the art that the location of said closed end and open end of air nozzle pipes can be below or above a horizontal lateral member of an underdrain assembly or block, in other words, said closed and open ends can be situated in the lower chamber and upper chamber, respectively, depending on the desired effect or distribution of air within said underdrain. It is considered that it would have been obvious to one of ordinary skill in the art to add the embodiments of the underdrain assembly taught by Eades et al. (659) to that underdrain block of Brown et al. (388), as modified by Brown et al. (920), in order to provide a uniform air flow distribution within said underdrain system, as stated in column 1, lines 56 - 59.

**(11) *Response to Arguments***

**A. The following summarizes examiner's response to the arguments made by the applicants according to the issues enumerated by the applicants.**

**Response to applicant's arguments against specific rejections:**

**1. Claim 18 is unpatentable over the combination of Brown et al. (388) and Brown et al. (920).**

Applicants' argument that Brown et al. (920), the secondary reference, had failed to teach two vertical lateral members which form three chambers of approximately equal size (See

page 7, Amended Appeal Brief (Paper No. 22), lines 15 – 16), is noted, however, it is held that the underdrain block of Brown (920) had two vertical (straight) lateral members dividing the lower portion (below the horizontal member) to form three lower chambers of approximately (here, the term “approximately” had been used loosely to mean at least 50% the same or equal to the actual size/value) equal size, and two substantially vertical lateral members dividing the upper portion (above the horizontal lateral) to form three upper chambers of approximately equal size, as in fig. 2. One argument lies between what “approximately equal” mean. Since it has not been determined the upper and lower limits of this claim language, the term had been loosely used by the examiner to mean or include “at least 50 or more% the same or equal to the actual size”, and therefore, the 3 chambers formed by the vertical laterals of Brown (920) are considered approximately equal by those standards. Another argument is that there are “four vertical lateral members” in the underdrain block of Brown 920, and not “two” as claimed by the applicants (see Amended Appeal Brief (Paper No. 22), page 7, lines 17-18). In response to this last argument, the claim language of claim 18 is open to an interpretation of having more than three lateral members first of all, because of the term “comprising” used after the preamble. The language of the claims are open such that the broadest possible interpretation can be done in order to meet the invention. In this instance, claim 18 had the preamble “the underdrain *comprising*”, which is a type of open language that leads to the broadest possible interpretation. In other words, in the claims, the term “comprising” does not mean that the invention merely consists of the elements recited after this language, however, according to the definition of an open language in the claims, it means that there could be other elements which may be recited or

included in the prior art and not recited by the claimed invention, but as long as the elements claimed by the invention are met, the prior art applies to the invention, making it unpatentable either for lacking novelty or being obvious from the prior art. [See M.P.E.P. 2111.03 and *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex Parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948)]. For example, a portion of the language of claim 18 states "the underdrain block comprising three lateral members within the underdrain block comprising two vertical lateral members and one horizontal member". This could be interpreted in the broadest way as an underdrain block which may have at least or more than three lateral members wherein two of the laterals are vertical and one is at least a horizontal lateral member. In using Berkebile et al, which is one of the primary references, Berkebile et al. had disclosed such an underdrain having at least three laterals in which two are at least vertical and one is horizontal when it was used to reject claim 18. Therefore, it is in this manner that the examiner had interpreted the claims of the instant application, using the broadest and best possible interpretation for which the prior art are applicable. Secondly, in the underdrain of the claimed invention, applicants has been misleading when they said that the claimed underdrain only has a total of three lateral members comprising two vertical laterals and one horizontal member to form the six chambers [I.e. three of which are lower chambers of approximately equal size and the other three are upper chambers of approximately equal size]. If one would look at applicant's invention, as depicted by the figures submitted in the instant application, the alleged "two vertical laterals" can be seen or interpreted as being actually "four vertical laterals" because the horizontal member further divides the two



vertical laterals by their intersection, into two upper vertical laterals and two lower vertical laterals to form the six chambered-underdrain block of the invention. In applicants' claim 18, just like the underdrain of the prior art, Brown 920, there are three lateral members comprising two vertical members subdividing an interior of the block into three (lower) approximately equal chambers, as in fig. 2, and one horizontal member intersecting those two vertical laterals to form six chambers within the block. There is no language in the claim that prevents the addition or using two other laterals such as the inclined or substantially vertical laterals of Brown 920 in claim 18. Once again, the term "comprising" here is important, since the term itself lends the claim for a broader interpretation in which other elements which may not be recited, can be part of the prior art product used against the claimed invention.

In response to applicants' argument that Brown 920 which requires 5 laterals to form the six chambers within the underdrain block being contrary to what is claimed by applicants (see Amended Appeal Brief (Paper No. 22), page 7, lines 19-20), the examiner doesn't agree with this conclusion. As mentioned above, the horizontal member claimed in the invention further divides the vertical laterals by its intersection therewith, and therefore actually forming four separate vertical laterals, two of which are above the horizontal member and the other two below the horizontal member. In conclusion, the total number of lateral members within the block of the invention is actually not just three, but actually five, as in Brown 920, because the horizontal member which is the fifth lateral divides the two vertical laterals into four pieces: first and

second vertical laterals being those above the horizontal/fifth lateral, and the third and fourth vertical laterals are those below the horizontal lateral (see figs. 1 – 5 of the instant application).

Brown (920) had taught that a plurality of metering orifices formed in the laterals/ribs within the underdrain enhance uniform distribution of backwash fluids, as in col. 4, lines 28 – 31. The fact is the plurality of metering orifices would not be existent without existence of lateral members within the underdrain blocks. Therefore, by dividing and subdividing the interior of the block by providing a plurality of laterals therewithin, the number of metering orifices within the block are also increasing, thereby further enhancing uniform distribution of backwash fluids. Thus resulting to an improved or more efficient cleaning of the filter media bed supported thereby, which is the primary motivation for adding more laterals or further dividing the underdrain of Brown 388 by adding the teachings of Brown 920.

Finally, applicants' argument that Brown (388), the primary reference, discloses only a specific construction of the interior of the underdrain block (i.e. only 4 chambers formed by the laterals in the underdrain) and that one of ordinary skill would not modify the block of Brown 388 as proposed by the examiner (i.e. no suggestion or motivation to combine the teachings of Brown 388 and 920) [see Amended Appeal Brief (Paper No. 22), page 8, lines 6 – 11]. This is untrue, when in fact, Brown (388) [see col. 10, lines 41 – 60] discloses addition of more liquid conduits/chambers within the underdrain block in order to improve uniform distribution of backwash water and air therethrough. This shows that Brown (388)'s invention is open to have

more than the 4 chambers depicted in Figs. 11 – 12, and therefore, the combination of Brown (388) with that of Brown (920) whose underdrain had more than 4 chambers therewithin is not only possible, but recommended.

The applicants argued that the combination of the teachings of Brown (388) with that of Brown et al. (920) that the three lateral members within the block would not have produced the three upper chambers of equal size and three lower chambers of equal size. The examiner disagree with this conclusion. In fact, the primary reference had already taught or disclosed the fact that the chambers formed by the lateral members within the underdrain block can be designed to have approximately equal sizes (see Fig. 11 or 12 of Brown '388).

**2. Claim 18 is unpatentable over the combination of Berkebile et al. (627) and Brown et al. (920).**

The applicants argued that Berkebile does not provide any teachings lacking in Brown 920 necessary to render obvious claim 18 and particularly, Berkebile fails to teach an underdrain block divided into three upper sections of approximately equal size and two lower sections of approximately *each* size (see Supplemental Appeal Brief, paper No. 25, page 7, lines 14 – 17). The examiner believes that a typographical error had been made in the argument, particularly, with the last phrase “approximately each size”, which should have been “approximately **equal** size”. First of all, the examiner disagrees that the combination of Berkebile et al. in view of

Brown 920 does not render the invention obvious. The examiner wants to point out that the arguments made by the applicants in this particular issue are incorrect, since the rejections (see Office Action, paper No. 23, pages 11- 12) were made according to the combination of **Berkebile et al. in view of Brown 920**, and not the other way around, which is Brown 920 in view of Berkebile, as argued by the applicants. In response to argument above, Berkebile et al., the primary reference, disclose an underdrain block divided into three upper sections of approximately equal size and two lower sections of approximately equal size (see Fig. 2). The lacking of this primary reference is a third chamber in the lower portion of the underdrain block (below the horizontal member), such that there are also three lower sections/chambers of approximately equal size. In order to provide this third lower section/chamber, Brown et al. (920), the secondary reference, had been applied. Brown et al. (920) teach an underdrain block with three upper sections/chambers with approximately equal size and three lower section/chambers of approximately equal size (see Fig. 1).

The applicants argued that in the combination of the teachings of Berkebile et al. (627) with that of Brown et al. (920) that the three lateral members within the block would not have produced the three upper chambers of equal size and three lower chambers of equal size. The examiner disagree with this conclusion. In fact, the primary reference (Berkebile et al.) had already taught or disclosed this fact in which the chambers formed by the lateral members within the underdrain block are of approximately equal size (see Fig. 2 of Berkebile et al. '627; in this instance two of the chambers, 28 & 30 are of equal sizes and the others 36, 38 & 40 are

approximately equal). The secondary reference was simply used to show that the design of having 6 chambers of approximately equal size already exists in the art and that the addition of another vertical lateral member to divide the block had been done and known in the art. The examiner disagrees that there isn't motivation or suggestion to modify Berkebile such that it has three lower chambers let alone three lower chambers of equal size (see Supplement Brief, Paper No. 25, page 7, lines 20 – 21). The motivation is to provide additional conduits/chambers for the purpose of evenly/uniformly distributing and mixing of backwash water and air passing through the underdrain block of Berkebile, prior to introduction into the filter media, which had been given in the Office Action, Paper No. 23, page 12, lines 12 – 18.

**3. Claim 19 is unpatentable over Brown et al. (388) or Berkebile et al. (627) and Brown (920) and further in view of Eades et al. (659).**

Eades et al (659), the tertiary reference, had been added to the combination of Brown (388) or Berkebile, in view of Brown (920), to further add the teachings of a plurality of air nozzles (31) to be placed in sections of an underdrain filter system and to be located in different lengths/points along the length of the underdrain, as in the abstract and fig. 2. Eades et al. had taught each of the air nozzles (20, 31) comprising a pipe having an open end below the horizontal member (21) and a closed end (34) above the horizontal member, and the pipe is extending from a lower wall of the underdrain through an internal orifice into an upper chamber of the underdrain (see figs. 1 – 3), and each of the pipes having at least one slot proximate the

closed end and, said pipe further having a hole situated in the lower chamber substantially near the horizontal lateral member. Eades et al. do not teach the vertical slot being situated in the lower chamber near the lower wall and the open end being situated in the upper chamber, however, it is considered obvious to one of ordinary skill in the art at the time of the invention that the orientation of the air nozzles/pipes (20) may be arbitrary or reversed, depending on the desired effect (I.e. direction of air flow) by the user. In other words, the air nozzle pipes (20) could be reversed in orientation, such that the open end of the pipes/nozzles are in the upper portion/chamber of underdrain (above the lateral member 21) and the slots near the closed end would then be placed at the lower chamber/portion (below the lateral 21) of the underdrain. In this manner or orientation of the air pipes, the air flow is directed to the upper portions of the underdrain block, instead of the lower portions as was in Eades et al. In addition, the type or shape of the slots formed on the pipes (I.e. vertical or horizontal) has been considered a matter of design choice by the manufacturer or user, since there is no evidence that the shape of the slot is significant in the applicant's specification. [See *In re Dailey* 357 F. 2d 669, 149 USPQ 47 (CCPA 1966)].

In response to applicants' arguments that there is no motivation to modify the underdrain of Brown by adding the air nozzles (taught by Eades et al.) in the interior thereof (see Amended Appeal Brief, page 9, lines 8 – 9 & 17 – 18), this is simply not true. Air flow or air pulsing of the underdrain blocks such as those taught by Brown (388) would be necessary to keep the water holes/apertures for backwashing open and unclogged. It is apparent that the internal openings

within the interior of the underdrain block would have to remain open in order for water to flow therethrough for backwashing and cleaning of the supported filter media can be performed. The motivation for adding the teachings of Eades et al. to that of the block of Brown (388), is therefore, providing means for air (for pulsing in order to clean the apertures for water flow which is intended for backwashing so that the filter media supported by the block can be cleaned) distribution within the block of Brown, as already mentioned in the Final action by the examiner, Paper No. 17, pages 8 – 9.

Applicants' arguments referring to Eades et al. not teaching certain aspects or features of the claimed invention such as the upper and lower chambers of the underdrain block and the orientation of the air nozzles in those chambers, is considered irrelevant. First of all, the primary reference, Brown 388 had already disclosed those features, and Eades et al. which is the tertiary reference, is simply used to provide the lackings (I, e. air nozzles within the block) of the primary reference. The question remains as to what is obvious to one of ordinary skill in the art. That is what this Board had to decide is that despite applicants' arguments that the combination of the three prior art does or does not constitute or make the claimed invention, as claimed in claim 19.

**4. Claims 1 and 5 are unpatentable over Roberts (765).**

Applicants argument that Roberts, a primary reference, cannot possibly anticipate Claims 1 or 5 as each and every underdrain block has at least one joint (see Supplemental Brief, page 8, lines 11 – 12), is not true and misleading. First of all, Roberts does meet all the structural criteria or features claimed as the invention in claim 1 (see Office Action page 4, paragraph 7). The argument that each and every underdrain block of Roberts is not jointless, is not true. First of all, the joints mentioned by the applicants that were placed on the blocks of Roberts were there in order to make a larger and longer filter media support, as required by a particular application. Since there was no definite length of filter media claimed by the invention in claim 1, it had been considered inherent that depending upon the length desired or needed by the user for supporting a particular length of filter media bed, the continuous extruded block of Roberts which may be cut to any specific lengths, including those longer than 4 feet, thus not necessitating the use of joints (thus, jointless) to form one underdrain block, anticipate the underdrain block of the invention. Furthermore, although it is true that Roberts indicated that the filter bottom may be formed of multiple blocks which may have a plurality of joints between each block, as argued/mentioned in the Supplemental Brief, page 8, lines 15 – 19, however, since in the art, the filter media beds could be not only longer than 4 feet, but could also be wider than 4 feet, it is considered inherent that numerous continuous multi-block units were cut to lengths easier for transport to a site of the filtration system not near the manufacturing site of the underdrain blocks and then, there at the site of the filtration system, they are formed and put together into any desired configuration (to any desired widths or lengths with either use of joints or not) to support a specific/desired filtration area, and thus they do require joints to form the



larger and wider filter underdrain block support. However, it is also inherent that if the filter media bed to be supported by the block is only of short lengths and has the same width as the already extruded continuous multi-block single unit (prior to cutting), then there is no need for any joints, (thus the block is jointless), since the continuous multi-block single unit can be extruded to any particular lengths necessary without cutting it. Therefore, the examiner disagrees with the applicants' allegation that the underdrain block as claimed in claims 1 and 5 as the invention is novel and patentable over Roberts (765).

**5. Claims 1 and 5 are unpatentable over Berkebile et al. (627).**

In response to applicants argument that Berkebile et al. do not anticipate claims 1 or 5, as in the Supplemental Brief, page 9, lines 1 – 6, the examiner once again, would have to rely on the counterargument that not only the length of the filter media bed could be of any desired length as a matter of choice by the user, the underdrain block of Berkebile et al., is considered the same invention as the applicants, thus, it is anticipated by Berkebile et al. particularly when the desired lengths of the underdrain block is about 2 – 4 feet long. In other words, it is inherent that if the filter media bed to be supported by the underdrain block is a small media bed of about 2 – 4 feet length, then the underdrain block of Berkebile et al., satisfies all the limitations recited in claims 1 or 5 and thereby would substantially extend the length of the filter media bed, since it has the same length as the block, and therefore the underdrain block would not require any joints (thus, be jointless.). The arguments by the applicants that the underdrain block of Berkebile et

al. is a multi-block unit formed by numerous blocks joined by grouting or some form of joint means is irrelevant since the individual underdrain blocks can be used alone (i.e. "by themselves") and thus require no joints if the length of the filter media bed is of the same or substantially the same as the individual underdrain block of 2 – 4 feet long. The blocks are only formed into a multi-block unit joined by grouting or other forms of joint means because the filter media bed to be supported by the blocks are actually longer and spans wider & longer than the available underdrain blocks. ***This would not be necessary if the filter media bed it is supporting is shorter or about the same length of the already cut/available individual underdrain blocks.***

Since the actual size of a filter media bed is not claimed by claim 1, it is considered by the examiner that at least one individual block of Berkebile et al., which is jointless, is the same underdrain block being claimed in claim 1. In conclusion, since Berkebile et al. had disclosed/anticipated all the required structural limitations of the inventions as claimed in claims 1 or 5 (see Office action, paper No. 23, pages 4 – 5, paragraph 8), the examiner considered the inventions not novel and thus, are unpatentable over Berkebile et al.

**6. Claims 1 and 5 are unpatentable over Brown et al. (U.S. 5,489,388).**

In response to applicants argument that Brown et al. (388) does not render obvious any of the pending claims (such as claims 1 and 5) and that Brown (388) does not render the invention obvious that it certainly cannot anticipate the same, it is unpersuasive and simply untrue. See office action, Paper no. 23, page 5 – 6, paragraph 9 for the 102 rejection of the invention as

claimed by claims 1 and 5, as anticipated by Brown (388). The same argument as made above in using Roberts and Berkebile et al, as primary references, in the rejection of these two claims, is incorporated herein. In considering claims 1 and 5, a filter media bed was not considered as part of the claimed invention and its length had not been given/claimed, and thus considered to be arbitrary. Since the length of the filter media bed can be any desired length as a matter of choice by the user, the underdrain block of Brown et al., is considered the same invention as the applicants, particularly when the desired lengths of the block is about 2 – 4 feet long. In other words, it is inherent that if the filter media bed to be supported by the underdrain block is a small media bed of about 2 – 4 feet length, then the underdrain block of Brown et al., satisfies all the limitations recited and thereby would substantially extend the length of the filter media bed, since it has the same length as the block, and therefore the underdrain block would not require any joints (thus, be jointless.).

The arguments by the applicants that the underdrain block of Brown et al. is a multi-block unit formed by numerous blocks joined by grouting or some form of joint means is irrelevant since the individual underdrain blocks can be used alone or by themselves and thus require no joints if the length of the filter media bed is of the same or substantially the same as the individual underdrain block of 2 – 4 feet long. The blocks are only formed into a multi-block unit joined by grouting or other forms of joint means because the filter media bed to be supported by the blocks are actually longer and spans wider & longer than the available underdrain blocks. This would not be necessary if the filter media bed it is supporting is shorter

or about the same length of the already cut/available individual underdrain blocks. Since the actual size of a filter media bed is not claimed by claim 1, it is considered by the examiner that at least one individual block of Brown et al., which is jointless, is the same underdrain block being claimed in claim 1. In conclusion, since Brown et al. had disclosed/anticipated all the required structural limitations of the inventions claimed in claim 1 and 5, the examiner considered the inventions not novel and thus, are unpatentable over Brown et al. (388).

**7. Claims 6 – 7 and 28 are unpatentable over Brown (388) in view of Roberts (765) or Berkebile et al. (627).**

In response to the applicants' argument that the secondary references (Roberts or Berkebile et al.) not supplying the deficiencies of the primary reference, Brown et al. (388) particularly, in reference to claims 6 – 7 and 28, this is not true and unpersuasive. First of all, it is considered obvious to a person of ordinary skill in the art that depending upon the desired length of the underdrain block, which can be 2 feet, 4 feet or even at least 10 feet, the underdrain block of Brown et al. (388) can be modified by adding the teachings of Roberts or Berkebile et al, by providing extruded continuous lengths of the filter underdrain block of any desired or predetermined lengths including that of at least 10 feet, if the filter media bed to be supported thereby is about the same length or longer than the available underdrain blocks. Here, the examiner had considered that *lengthening the underdrain block to at least 10 feet is an obvious*

*modification and simply a mere scaling up of an old invention.* It had been considered that if an ordinary person had a smaller filter bed [I.e. no more than 4 feet long] , an underdrain block of 4 feet which had been disclosed by Brown et al. would be sufficient to support that filter bed. However, since some liquid filtration systems can be scaled - up or some applications required larger filtration systems, thus larger filter beds, *it is considered a mere optimization of the prior art to lengthen the size of the filter underdrain block as the filter bed is also lengthen.* The examiner does not dispute with the applicants that some long underdrain blocks had been made by joining short underdrain blocks together using joints or by grouting, however, this was done so because transporting huge and longer underdrain blocks can be burdensome and expensive to the user. Longer underdrain blocks would require heavy machinery to lift them and place them in their desired locations, however shorter underdrain blocks can be easily lifted by a person manually and would not require the expensive costs of heavy machinery. However, if costs are not a concern for the user and as an alternative to building longer supports for longer filter beds, it is considered obvious that the user can extrude longer lengths of underdrain blocks which would not require joints (thus, jointless) or grouting to form them, and transport those blocks, without cutting them to shorter lengths. In this way, the user saves time and effort of making/cutting shorter lengths of underdrain blocks and the effort and time needed in grouting or joining shorter underdrain blocks together.

Reiterating the point made above, *if added costs of heavy machinery are not the main concern of the user but saving time and effort of cutting shorter underdrain blocks and/or*

*grouting or joining shorter available underdrain blocks together, then longer extruded continuous blocks of at least 20 feet can be done in order to provide the necessary length need to provide the support for a much longer filter bed.*

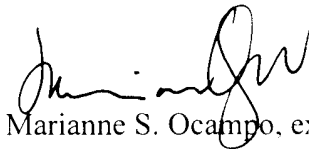
Lastly, longer continuous (jointless) blocks of underdrain had been made and then later cut to a predetermined size, such as of 4 feet long, are already known in the art. It is also considered an *mere optimization step to cut those longer continuous lengths of underdrain blocks to any predetermined size/length, such as at least 5 feet*, as claimed by claim 28, *depending on the length of the filter bed needed to be supported by the underdrain block*. It is also obvious that continuous lengths of extruded underdrain blocks be cut to any lengths of predetermined sizes, such as those of at least 5 feet long, as taught by Roberts or Berkebile et al., in order to save the user time and effort of cutting the blocks and grouting them or joining them together to support at least 5 feet-long filter media beds.

B. In rejecting claim 4 under U.S.C. 112, second paragraph, the examiner had considered that the limitation of a filter media bed in the preceding claim, being the base claim 1, is not a positive limitation, which means that in rejecting claim 1 of the instant application, the invention being rejected consists only of the subcombination of an underdrain block and without a filter media bed. However, in claim 4 which is a dependent claim of the base claim 1, the limitation of a filter media bed is positively recited. However, since there had been no mention of what the length of the filter media bed is in the base claim (since there was no filter media bed considered

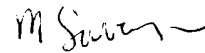
existing with the invention), claim 4 was considered vague and indefinite, and lacking proper antecedent basis for the limitation "the length of the filter media bed". The applicants argued that the support or basis for the limitation of "a filter media bed" is in the preamble of the claim, however, the portion of the preamble which recited the limitation "a filter media bed" that the applicants are referring to is actually *the intended use clause* of the claim. In the 112 rejection made, the intended use clause was not considered as a distinguishing limitation of the invention, which is that of a subcombination in the form of an underdrain block. It had been considered that the underdrain block by itself can be formed without the filter media bed, and thus, in considering this point, without knowing what the length of the filter media bed is, and the fact that at the time of manufacture, there is no knowledge of the length of the filter media bed is available since it has not been considered or merely does not exist, then the limitations of claim 4 is considered unclear and indefinite.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



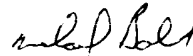
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M.S.O.  
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